50. The composite grating of claim 45 wherein the subgratings are supported on a surface of the active material, each respective subgrating satisfying the superficial grating condition for the respective subbandwidth of light and the input path and the output path.

cont'd a1

51. The composite grating of claim 45 wherein the subgratings comprise spatial variations in the refractive index of the active material.--

REMARKS

Claims 1-26 are cancelled and additional claims 27-51 are added for consideration. The additional claims are supported in the specification. Examples of the support for each of the additional claims are given below.

Claim 27 is supported in the specification in various places, including at page 10, line 25 to page 12, line 15; (discussing diffraction by gratings and composite gratings composed of multiple gratings); page 12, line 17, to page 20, line 30 (discussing "programming" or formation of composite gratings in frequency-selective materials); page 20, line 31 to page 24, line 26 (discussing programming, or formation of composite gratings, in non-frequency selective materials, including use of an array of gratings or "spatial gradients" as a composite grating [page 21, line 30 to page 22, line 2]); page 9, line 30 to page 10, line 2, page 41 lines 8-10, and page 47, line 23 to page 48, line 12 (disclosing and discussing use of a composite grating or a "router" formed of such to produce a signal in response to a single or individual "address" or input pulse). The Bragg condition is discussed at page 11, line 7 to page 12, line 2. The surface grating condition is specifically mentioned at page 23, lines 1-3. Differential response of a composite grating to a particular waveform (i.e., production of a particular output pulse in response, and only in response, to a pulse substantially having a particular temporal waveform) is discussed specifically at various places throughout the specification and generally by the specification as a whole. A particular example of specific mention is found at page 15, lines 11-20.

Claims 28 and 29 involving co-extension of input and output paths and counter propagation of input and output pulses are supported at least by the embodiment shown in FIG. 6B in which the input pulse OB3 is carried to the grating by a fiber IF that is part of an array of fibers for carrying output pulses, such as output pulse OBS, away from the grating (see page 47, lines 8-13), and by the disclosure of the use of reflective gratings (see, e.g., page 39, line 26 to page 40, line 6), with which counter-propagation of reflected pulses is well known.

Claims 30-32 are supported by FIGS. 2B and 3 and the related discussion at page 29, line 12 to page 32, line 30.

Claim 33 is supported in various places throughout the specification, including, for example, at page 12 line 17 to page 24 line 26 (discussing formation of composite gratings on and/or in both frequency-selective and non-frequency selective active materials). The Bragg condition is discussed at page 11, line 7 to page 12, line 2.

Claim 34 is supported in various places including, for example, at page 12 line 17 to page 24 line 26 (discussing formation of composite gratings in and/or on both frequency-selective and non-frequency selective active materials). The surface grating condition is specifically mentioned at page 23, lines 1-3.

Claim 35 is supported, for example, at page 39, lines 16-19.

Claim 36 is supported, for example, at page 20, line 31 to page 24, line 26.

Claim 37 is supported at least by the material cited above in support of claim 27, and by the disclosure of the use of a composite grating to generate output pulses of a form recognizable by downstream equipment (detectors) at page 30, line 28 to page 39, line 10 and page 41, lines 8-10 and 11-16, and by the disclosure of using a composite grating to differentially recognize an address header and provide a signal detectable by a downstream device (a router) at page 47, line 31 to page 48, line 12.

Claims 38 and 39 are supported, for example, by the materials cited above in support of claims 33 and 34, respectively.

Claim 40 reciting co-extension of input and output paths and counter propagation of input and output pulses is supported at least by the embodiment shown in FIG. 6B in which the input pulse OB3 is carried to the grating by a fiber IF that is part of an array of fibers for carrying output pulses, such as output pulse OBS, away from the grating (see page 47, lines 8-13), and by the disclosure of the use of reflective gratings (see, e.g., page 39, line 26 to page 40, line 6), with which counter-propagation of reflected pulses is well known.

Claims 41 and 42 are supported, for example, by the materials cited above in support of claims 35 and 36, respectively.

Claim 43 is supported at least by the material cited above in support of claim 37, and the embodiments shown in FIGS. 6A and 6B, in which, respectively, the source S3 and the fiber IF serve as source of optical data to the respective composite gratings.

Claim 44 is supported, for example, by the material cited above in support of claim 37.

Claim 45 is supported, for example by the material cited above in support of claim 27.

Claims 46, 47, and 48 are supported, for example, by the material cited above in support of claims 28, 29, and 30, respectively.

Claims 49, 50, and 51 are supported, for example, by the material cited in support of claims 33, 34, and 35, respectively.

As outlined above, each of the additional claims is supported in the specification. The additional claims are believed to be allowable over the prior art. Consideration of these claims is requested accordingly.

Respectfully submitted,

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